



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,909	05/12/2006	Koudai Yoshizawa	040356-0588	3226
22428 7590 10/28/2011 FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007				
EXAMINER				
CONLEY, O K				
ART UNIT		PAPER NUMBER		
1726				
MAIL DATE		DELIVERY MODE		
10/28/2011		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/578,909

Applicant(s)

YOSHIZAWA ET AL.

Examiner

HELEN O.K. CONLEY

Art Unit

1726

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 9, 10 and 12-18 is/are pending in the application.
- 5a) Of the above claim(s) 12 and 13 is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 9, 10, 14-18 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-800)
Paper No(s)/Mail Date ____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

1. Applicants' Amendment has been received on 6/7/10. Claim 9 has been amended.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/6/10 has been entered.

Claims Analysis

4. Regarding claim 15, it doesn't appear the "LLC" in "LLC passage" impart any structure to the fuel cell stack. The recitation "LLC" for the passage is noted as "intended use" language and it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

5. For purposes of compact prosecution, the Applicants have defined "substantially 180 degrees" is represented by 521 of Fig. 3b and 511 of Fig. 3a. "Substantially 180 degrees" appears to include 90 degree angle (Page 9) and will be interpreted as such.
6. As best understood, please refer to the prior art rejections below.

Claim Rejections - 35 USC § 102

7. The rejections under 35 U.S.C 102(b) as being anticipated by Wada et al., on claims 9-11, 14-16 are maintained. The rejection is further clarified to parallel the claim amendments..
8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 9-10, 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Wada et al. (US Publication 2002/0192522 A1).

Regarding claim 9, the Wada et al. reference discloses fuel cell stack, comprising fuel cells (19) wherein a supply of an anode gas and a cathode gas for power generation. The fuel cell comprising an anode separator comprising an anode gas passage which has a meandering configuration with two or more bent portions (lower plate of Fig. 3) and a cathode separator comprising a cathode gas passage which has a

meandering configuration with bent portions (upper plate of Fig. 3). The number of bent portions of the cathode gas passage being equal to the number of the bent portions of the anode gas passage (Fig. 5). The cathode gas passage and the anode gas passage each having gas flows that are parallel and in opposite directions from each other (Fig. 5 and fig. 8). The separator further comprises outlet through-hole (34b or 33b) which is provided in a most downstream bent portion in at least one of the anode gas passage and the cathode gas passage, the through-hole allowing movement of moisture through the fuel cells.

Furthermore, the Wada et al. reference discloses the anode gas passage to have a configuration of two or more bent portions of substantially 180 degrees and the cathode gas passage to having bent portions of substantially 180 degrees.

Regarding claim 10, the Wada et al. reference discloses the fuel cell stack has a square shape cross-section and further comprises an anode gas supply manifold which supplies the anode gas to the anode gas passage of each fuel cell (33a) and an anode effluent exhaust manifold which recovers an anode effluent from the anode gas passage of each fuel cell (33b). The anode effluent exhaust manifold being arranged offset (Applicant's diagonally) with respect to the anode gas supply manifold in the cross-section of the fuel stack. A cathode gas supply manifold which supplies a cathode gas to the cathode gas passage of each fuel cell (34a) and a cathode effluent exhaust manifold which recovers cathode effluent from the cathode gas passage of each fuel cell (34b). The cathode effluent exhaust manifold being arranged offset (Applicants' diagonally) with respect to the cathode gas supply manifold in the cross-section of the

fuel cell stack. The anode gas supply manifold and the cathode effluent exhaust manifold are arranged in parallel along a first side of the stacking surface of the fuel cell (Fig. 3 to the left of the stack), while the anode effluent exhaust manifold and the cathode gas supply manifold are arranged in parallel along a second side (Fig. 3, to the right of the stack), which is opposed to the first side with respect to the cross-section of the fuel cell stack.

Regarding claim 14, the Wada et al. reference discloses a drain manifold (all of the plates that connect 32b together) which drains water in the through-hole to outside of the fuel cell stack (Fig. 7).

Regarding claim 15, the Wada et al reference discloses a plurality of adjacent fuel cells (fig. 1, P29, P54) are provided with a coolant passage (32a) therebetween which is substantially superimposed in a stacking direction on the cathode gas passage and through which a coolant flows in the same direction as a cathode gas that flows (34a) in the cathode gas passage.

Regarding claim 16, the Wada et al. reference discloses the fuel cell stack comprises supply manifolds that respectively distribute the anode gas, the cathode gas, and the coolant to the fuel cells, and exhaust manifolds that respectively recover an anode gas, a cathode gas, and a coolant from the fuel cells, and wherein the anode gas supply manifold, the cathode gas exhaust manifold and the coolant exhaust manifold are located on the left side of Fig. 3, while the anode gas exhaust manifold, the cathode gas supply manifold and the coolant supply manifold are located on the right side of Fig.

Claim Rejections - 35 USC § 103

10. The rejections under 35 U.S.C. 103(a) as being unpatentable over Wada et al. in view of Mizutani et al. on claims 17 and 18 are maintained. The rejection is repeated below for convenience.

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wada et al. (US Publication 2002/0192522 A1) in view of Mizutani et al. (US Patent 7,309,541).

Regarding claims 17 and 18, the Wada et al. reference discloses the claimed invention above and further incorporated herein. While the Wada et al. reference further discloses the anode gas passage and the cathode gas passage comprises 4 or more even number of bent portions (Fig. 5 and Fig. 8) and further discloses a through hole for the reactant outlet at the most down stream bent portion of the anode and cathode gas passage, however, the Wada et al. reference is silent in disclosing another through-hole in one of even numbered bent portions as counted from an inlet side of the anode gas passage. However the Mizutani et al. reference discloses a through-hole provided at the first even numbered bent portion (Fig. 5a and 5b) counted from the cathode and

anode inlet except for the most downstream bent portion. The Mizutani et al. reference discloses that these anode and cathode flow paths would benefit the fuel cell by reduction of pressure drop in contrast to the conventional long serpentine flow fields which would increase efficiency(4:50-65). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a through-hole provided an even numbered bent portion (Fig. 5a and 5b) counted from the cathode and anode inlet that this would allow reactant passage as disclosed by the Mizutani et al. reference for the bent portions of the long serpentine flow passages as disclosed by the Mizutani et al. reference in order to reduce pressure resistance and to optimize power output with superior performances.

Response to Arguments

13. Applicant's arguments filed 10/26/10 have been fully considered but they are not persuasive. Applicants' principal arguments are:

- a. The Applicants argue, "*However, claim 9 as amended clarifies that: (a) the bent portions are of substantially 180 degrees; and, (b) the through-hole is provided in a most downstream bent portion in at least one of the anode gas passage and the cathode gas passage, with the through-hole allowing movement of moisture through the fuel cells.*" Accordingly, the outlet through-holes 34b and 33b of Wada do not correspond to the bent portions of substantially 180 degrees of claim 9. Applicants respectfully submit that claim 9 is not anticipated by Wada cell stack." However, as can be seen by Fig. 3a and 3b comprising 511 and 521

respectively and defined as having "substantially 180 degrees." "Substantially 180 degrees" as defined by this disclosure also includes 90 degrees. Thereby also includes the most down stream portion of the Wada anode gas passage and the cathode gas passages with the outlet sides of 34b and 33b Wada.

- b.** Please refer to Item a for synonymous arguments applied to claims 17 and 18

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HELEN O.K. CONLEY whose telephone number is (571)272-5162. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HELEN O.K. CONLEY/
Primary Examiner, Art Unit 1726